

Claims:

1. A process for the production of a polyurethane product by reaction of a mixture of

(a) at least one organic polyisocyanate with

(b) a polyol composition comprising

(b1) from 60 to 99.5 percent by weight of a polyol compound having a functionality of 2 to 8 and a hydroxyl number of from 15 to 800 and

(b2) from 0.5 to 40 percent by weight of at least one polymer compound having a functionality of 1 to 12, a hydroxyl number of from 20 to 600 and containing at least one tertiary amine group, wherein the weight percent is based on the total amount of polyol composition (b), and

(b2) is obtained by the reactions of an epoxy resin (b3) and an amine wherein the amine is either a primary or a secondary amine or a molecule containing at least one tertiary nitrogen and at least one reactive hydrogen able to react with the epoxide; or

(b2) is (b4) a hydroxyl-tipped prepolymer obtained from the reaction of an excess of (b2) or a mixture thereof with a polyisocyanate; or

(b2) is (b5) a blend of several epoxides (b3) modified with one or more types of amines containing each at least one reactive hydrogen;

(c) optionally in the presence of a blowing agent; and

(d) optionally additives or auxiliary agents known per se for the production of polyurethane foams, elastomers and/or coatings.

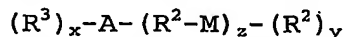
2. The process of Claim 1 wherein polyol (b1) comprises a polyether polyol, polyester polyol, polyhydroxy-terminated acetal resin, hydroxyl-terminated amine polyol, hydroxyl-terminated polyamine polyol or a mixture thereof.

3. The process of Claim 1 wherein polyol (b1) comprises a polyester polyol, a polyether polyol or a mixture thereof.

4. The process of Claim 1 wherein the secondary amine used for obtaining a polyol of (b2) is represented by HNR^1_2 , where each R^1

is independently a compound having 1 to 20 carbon atoms or may be attached together with the nitrogen atom and optionally other hetero atoms and alkyl-substituted hetero atoms to form one or two saturated heterocyclic or aromatic ring(s)...

5 5. The process of Claim 1 wherein the tertiary amine used for obtaining a polyol of (b2), is represented by



where A is either hydrogen, nitrogen or oxygen;

x is 0, 1 or 2;

10 z is 1 or 2

with the provisos x is zero when A is hydrogen, x and z are 1 when A is oxygen, and when A is nitrogen x and z can be 1 or 2 with the sum of x and z being 3;

R^2 at each occurrence is independently a moiety having 1 to 20
15 carbon atoms;

R^3 is hydrogen or a moiety having 1 to 20 carbon atoms;

M is an amine or polyamine, linear, branched or cyclic, with at least one tertiary amine group; and

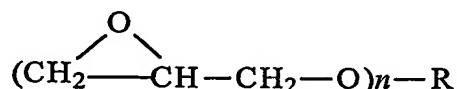
y is an integer from 0 to 6.

20 6. The process of Claim 1 wherein the secondary or tertiary amine used for the production of polyol (b2) is one or more amines selected from the group consisting of dimethylamine, diethylamine, N,N-dimethylethanolamine, N,N-dimethyl-N'-ethylenediamine, 3-dimethylamino-1-propanol, 1-dimethylamino-2-propanol, 3-
25 (dimethylamino) propylamine, dicyclohexylamine, 1-(3-aminopropyl)-imidazole, 3-hydroxymethyl quinuclidine, imidazole, 2-methylimidazole, 1-(2-aminoethyl)-piperazine, 1-methyl-piperazine, 3-quinuclidinol, tetramethylamino-bis-propylamine, 2-(2-aminoethoxy)-ethanol, N,N-dimethylaminoethyl-N'-methyl ethanolamine and 2-
30 (methylamino)-ethanol.

7. The process of Claim 1 wherein the secondary or tertiary amine used for the production of polyol (b2) is one or more amines selected from the group consisting of N,N'-dimethylethylenediamine, 4,6-dihydroxypyrimidine, 2,4-diamino-6-hydroxypyrimidine, 2,4-diamino-6-methyl-1,3,5-triazine, 3-aminopyridine, 2,4-diaminopyrimidine, 2-phenyl-imino-3-(2-hydroxyethyl)-oxazalodine, N-(-2-hydroxyethyl)-2-methyl-tetrahydropyrimidine, N-(2-hydroxyethyl)-imidazoline, 2,4-bis-(N-methyl-2-hydroxytetethylamino)-6-phenyl-1,3,5-triazine, bis-(dimethylaminopropyl)amino-2-propanol,

2-(2-methylaminoethyl)-pyridine, 2-(methylamino)-pyridine, 2-methylaminomethyl-1,3-dioxane and dimethylaminopropyl urea.

8. The process of Claim 1 wherein the epoxy resin for the production of polyol (b2) is represented by the general formula
5 general formula:



wherein R is substituted or unsubstituted aromatic, aliphatic, cycloaliphatic or heterocyclic polyvalent group and n had an average value of from 1 to less than 8.

9. The process of Claim 1 wherein the epoxy resin for the production of polyol (b2) is selected from one or more of the group consisting diglycidyl ethers of resorcinol, catechol, hydroquinone, bisphenol, bisphenol A, bisphenol AP (1,1-bis(4-hydroxylphenyl)-1-phenyl ethane), bisphenol F, bisphenol K, tetrabromobisphenol A,
10 phenol-formaldehyde novolac resins, alkyl substituted phenol-formaldehyde resins, phenol-hydroxybenzaldehyde resins, cresol-hydroxybenzaldehyde resins, dicyclopentadiene-phenol resins, trimethylolpropane triglycidyl ether, dicyclopentadiene-substituted phenol resins tetramethylbiphenol, tetramethyl-tetrabromobiphenol,
15 tetramethyltribromobiphenol, and tetrachlorobisphenol A and aliphatic diepoxides.

10. The process of Claim 9 wherein the epoxy resin for the production of polyol (b2) is an aliphatic diepoxide.

11. The process of any one of Claims 1-10 wherein the
25 polyurethane product is a rigid foam and the polyol (b1) and (b2) have an average functionality of 3 to 6 and an average hydroxyl number of 200 to 800.

12. The process of Claim 11 wherein the blowing agent for producing the rigid foam is a hydrocarbon, a
30 hydrochlorofluorocarbon, a hydrofluorocarbon, a hydrochlorocarbon or a mixture thereof.

13. A rigid foam produced by the process of Claim 12.

14. The process of any one of Claim 1-10 wherein the polyurethane product is a flexible foam and the polyol (b1) and

(b2) have an average functionality of 2 to 4 and an average hydroxyl number of 20 to 100.

15. A flexible foam produced by the process of Claim 14.

16. A polyol formulation comprising (b1) from 60 to 99.5 percent by weight of a polyol compound having a functionality of 2 to 8 and a hydroxyl number of from 15 to 800 and

(b2) from 0.5 to 40 percent by weight of at least one polymer compound having a functionality of 2 to 12, a hydroxyl number of from 20 to 600 and containing at least one tertiary amine group,

10 wherein the weight percent is based on the total amount of polyol composition (b), and

(b2) is obtained by the reactions of an epoxy resin (b3) and an amine wherein the amine is either a primary or a secondary amine or a molecule containing at least one tertiary nitrogen and at least one reactive hydrogen able to react with the peroxide; or

(b2) is (b4) a hydroxyl-tipped prepolymer obtained from the reaction of an excess of (b2) or a mixture thereof with a polyisocyanate; or

(b2) is (b5) a blend of several epoxides (b3) modified with one or more types of amines containing each at least one reactive hydrogen.